

What is claimed is:

1. An ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material at the same time or after starting supply of predetermined types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner.

2. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 1 wherein:

said predetermined types of crystal raw materials are the group III elements; and

other types of crystal raw materials than said predetermined types of crystal raw materials are the group V elements.

3. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 1 wherein:

said predetermined types of crystal raw materials are the group II elements; and

other types of crystal raw materials than said predetermined types of crystal raw materials are the group VI elements.

4. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 2 wherein:

said group III elements are Al and Ga, and said group V element is N;

supply of said Al and Ga are carried out alternately with respect to that of said N in a pulsed manner; and

said p-type impurity raw material is Mg.

5. An ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

a desired number of times for a cycle consisting of:

a first step wherein supply of TMGa, TMAI, and Cp_2Mg is commenced at a first timing, and supply of TMGa, TMAI, and Cp_2Mg is finished at a second timing at which supply of TMGa, TMAI, and Cp_2Mg which has been continued for a predetermined period of time was completed; and

a second step wherein supply of NH_3 is commenced immediately after or after the second timing at which supply of TMGa, TMAI, and Cp_2Mg was completed, and supply of NH_3 is finished at a third timing at which supply of NH_3 which has been continued for a predetermined period of time was completed; being repeated, whereby said ultraviolet light-emitting device

in which a p-type semiconductor is used is prepared.

6. An ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being prepared by supplying a p-type impurity raw material and an n-type impurity raw material at close timing with each other at the same time or after starting supply of predetermined plural types of crystal raw materials, besides before starting supply of other types of crystal raw materials than said predetermined plural types of crystal raw materials in one cycle wherein all the types of crystal raw materials of said plural types of crystal raw materials are supplied in one time each in case of making crystal growth by supplying alternately said plural types of crystal raw materials in a pulsed manner.

7. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 6 wherein:

said p-type semiconductor is prepared by starting supply of said p-type impurity raw material in synchronous with commencement of supply for said predetermined plural types of crystal raw materials; starting supply of said n-type impurity raw material after finishing supply of said p-type impurity raw material; and finishing supply of said n-type impurity before commencement of supply for other types of crystal raw materials

than said predetermined plural types of crystal raw materials.

8. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 6 wherein:

said p-type semiconductor is prepared by maintaining a period of time wherein said p-type impurity raw material and said n-type impurity raw material are supplied at the same time, respectively.

9. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in any one of claims 6, 7, and 8 wherein:

said predetermined plural types of crystal raw materials are the group III elements; and

said other types of crystal raw materials than said predetermined plural types of crystal raw materials are the group V elements.

10. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in any one of claims 6, 7, and 8 wherein:

said predetermined plural types of crystal raw materials are the group II elements; and

said other types of crystal raw materials than said predetermined plural types of crystal raw materials are the group

VI elements.

11. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in claim 9 wherein:

said group III elements are Al and Ga, and said group V element is N;

supply of said Al and Ga is carried out alternately with respect to that of said N in a pulsed manner;

said first impurity raw material is Mg; and

said second impurity raw material is Si.

12. An ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

a desired number of times for a cycle consisting of:

a first step wherein supply of TMGa, TMAI, and Cp_2Mg is commenced at a first timing, and supply of Cp_2Mg is finished at a second timing at which supply of Cp_2Mg which has been continued for a predetermined period of time was completed;

a second step wherein supply of TESI is commenced immediately after or after the second timing at which supply of Cp_2Mg was finished, and supply of TMGa, TMAI, and TESI is finished at a third timing at which supply of TESI has been continued for a predetermined period of time was completed; and

a third step wherein supply of NH_3 is commenced immediately after or after the third timing at which supply of TMGa, TMAI,

and TESI was completed, and supply of NH_3 is finished at a fourth timing at which supply of NH_3 which has been continued for a predetermined period of time was completed; being repeated, whereby said ultraviolet light-emitting device in which a p-type semiconductor is used is prepared.

13. An ultraviolet light-emitting device in which a p-type semiconductor is used as claimed in any one of claims 4, 5, 11, and 12 wherein:

a small amount of N is continuously supplied in case of preparing said p-type semiconductor.

14. An ultraviolet light-emitting device in which a p-type semiconductor is used, comprising:

said p-type semiconductor being composed of AlGaN prepared by laminating a crystal layer formed from Ga and Al, and a crystal layer formed from N;

a crystal layer formed from said Ga and Al being doped with Mg and Si; and

Mg and Si being placed closely in said crystal layer formed from Ga and Al at a predetermined ratio.